

What is claimed is:

1. A process for producing a film containing a chemotactic factor substance, which is capable of controlling a chemotactic function, comprising:

providing a film having an area containing the chemotactic factor substance;  
placing the film in an atmosphere containing at least one of oxygen and ozone;  
irradiating the film with light from a light source, and

changing the amount of irradiation exposure essentially continuously across the area of the film containing the chemotactic factor substance in a given direction such that the chemotactic factor substance is correspondingly degenerated dependent on the amount of irradiation to produce a concentration gradient of the chemotactic factor substance in the film.

2. Process for producing a film as claimed in claim 1, further comprising:

positioning the light source above the film, and

positioning a light shielding plate between the film containing a chemotactic factor substance and the light source, and

during irradiation of the film, changing the relative positional relationship between the light shielding plate and the film of the chemotactic factor substance in the given direction to produce a concentration gradient of the chemotactic factor substance in the film.

3. Process for producing a film as claimed in claim 1, further comprising:

positioning the light source above the film, and

positioning a mask with a region of light transmission factor change in which the light transmission factor changes continuously in a given direction between the film containing a chemotactic factor substance and the light source, and

during irradiation of the film, changing the amount of irradiation exposure of the film continuously as the changing light transmission factor changes continuously in the given direction to produce a concentration gradient of the chemotactic factor substance in the film.

4. Process for producing a film as claimed in one of claim 1, wherein the light source emits light of at least one wavelength which degenerates the chemotactic factor substance.

5. An artificial material containing a chemotactic factor substance capable of controlling the chemotactic function comprising:

a substrate; and

a film on the substrate containing a chemotactic factor substance for controlling the chemotactic function produced according the method of claim 1.

6. An artificial material containing a chemotactic factor substance capable of controlling the chemotactic function comprising:

a substrate; and

a film on the substrate containing a chemotactic factor substance for controlling the chemotactic function produced according the method of claim 2.

7. An artificial material containing a chemotactic factor substance capable of controlling the chemotactic function comprising:

a substrate; and

a film on the substrate containing a chemotactic factor substance for controlling the chemotactic function produced according the method of claim 3.

8. Process for producing an artificial material comprising the following steps:

providing a substrate;

providing a base treatment film having thereon an adhesive film of an adhesive substance with the ability to cement a chemotactic factor substance;

irradiating the adhesive film in an atmosphere composed of at least one of oxygen and ozone with light from a light source such that the amount of irradiation of the area of the adhesive film changes essentially continuously in a given direction such that the adhesive substance is degenerated in a manner corresponding to the amount of irradiation to obtain a concentration gradient in the adhesive film;

applying a solution containing the chemotactic factor substance to the area of the irradiated adhesive film on the base treatment film to form a film containing the chemotactic factor substance, in which the chemotactic factor substance is present in the given direction in a concentration gradient which essentially corresponds to the concentration gradient of the adhesive film.

9. Process for producing a film as claimed in one of claim 1, wherein the atmosphere comprises air.

10. Process for producing a film as claimed in one of claim 2, wherein the atmosphere comprises air.

11. Process for producing a film as claimed in one of claim 3, wherein the atmosphere comprises air.

12. Process for producing a film as claimed in one of claim 2, wherein the light source is moved.

13. Process for producing a film as claimed in one of claim 2, wherein the film is moved.

14. Process for producing a film as claimed in one of claim 2, wherein both the light source and the film are moved.

15. Process for producing an artificial material as claimed in claim 8, further comprising:

positioning the light source above the coated substrate, and

positioning a light shielding plated between the base treatment film, having the film containing the adhesive substance, and the light source, and

during irradiation, changing the relative positional relationship between the light shielding plate and the film containing the adhesive substance in the given direction to produce a concentration gradient of the adhesive substance in the film.

16. Process for producing an artificial material as claimed in claim 1, further comprising:

positioning the light source above the base treatment film, and

positioning a mask with a region of light transmission factor change, in which the light transmission factor changes continuously in a given direction, between the base treatment film having the film containing the adhesive substance and the light source,

during irradiation of the film, continuously changing the amount of irradiation exposure of the film as the changing light transmission factor changes continuously in the given direction to produce a concentration gradient of the adhesive substance in the film.

17. Process for producing a film as claimed in one of claim 15, wherein the light source is moved.

18. Process for producing a film as claimed in one of claim 15, wherein the substrate is moved.

19. Process for producing a film as claimed in one of claim 15, wherein both the light source and the substrate are moved.

20. Process for producing a film as claimed in one of claim 8, wherein the atmosphere comprises air.